# Pacific Ocean Perch Data Collected during Jointly Funded Cruises Aboard the *(M/V Ocean Selector)* (August 10-22) and the *(M/V Free Enterprise No. 1)* (July 31-August 9), 1983

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# PACIFIC OCEAN PERCH DATA COLLECTED DURING JOINTLY FUNDED CRUISES ABOARD THE M/V OCEAN SELECTOR (AUGUST 10-22) AND THE M/V FREE ENTERPRISE NO. 1 (JULY 31-AUGUST 9), 1983

by

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## ABSTRACT

Nagtegaal, D. A., B. M. Leaman, and R. D. Stanley. 1985. Pacific ocean perch data collected during jointly funded cruises aboard the M/V OCEAN SELECTOR (August 10-22) and the M/V FREE ENTERPRISE NO. 1 (July 31-August 9), 1983. Can. Data Rep. Fish. Aquat. Sci. 525: 10 p.

The rockfish investigation unit of the Pacific Biological Station participated in two jointly funded commercial trawl fishing trips to examine the summer distribution and size composition of Pacific ocean perch (Sebastes alutus) in depths greater than 165 fath at the mouth of Goose Island Gully, Queen Charlotte Sound. Results of these cruises supported the contention that the winter fishery which commenced in 1983 was exploiting the traditional stock on its winter grounds.

Key words: Pacific ocean perch, Goose Island Gully, winter fishery

## RÉSUMÉ

Nagtegaal, D. A., B. M. Leaman, and R. D. Stanley. 1985. Pacific ocean perch data collected during jointly funded cruises aboard the M/V OCEAN SELECTOR (August 10-22) and the M/V FREE ENTERPRISE NO. 1 (July 31-August 9), 1983. Can. Data Rep. Fish. Aquat. Sci. 525: 10 p.

L'unité d'étude du sébaste de la Station de biologie du Pacifique a participé à deux expéditions de chalutage commercial financées conjointement afin d'examiner la répartition estivale et la composition selon la taille des stocks de sébaste à longue mâchoire (Sebastes alutus) fréquentant des profondeurs supérieures à 165 brasses à l'embouchure du goulet des îles Goose, dans le bassin Reine-Charlotte. Les résultats de ces expéditions étayent l'affirmation que la pêche d'hiver qui a débuté en 1983 exploite le stock ancestral dans ses aires de répartition hivernale.

Mots-clés: sébaste à longue mâchoire, goulet des îles Goose, pêche d'hiver

## INTRODUCTION

The Rockfish Investigation unit of the Pacific Biological Station, Nanaimo, participated in two jointly funded commercial trawl fishing trips in 1983 aboard the M/V OCEAN SELECTOR (August 10-22) and the M/V FREE ENTERPRISE NO. 1 (July 31-August 9). This report documents the tows made and the samples collected. Detailed location information is excluded to protect the confidentiality of the vessels' activities.

The purpose of these trips was to examine the summer distribution and size-composition of Pacific ocean perch (Sebastes alutus) in depths greater than 165 fath (300 m) at the mouth of Goose Island Gully, Queen Charlotte Sound.

The North American fishery of this stock traditionally took place during the summer months in shallower waters (<165 fath - 300 m) of the gully. The fishery changed in 1983, when a small number of Canadian boats successfully fished during January-March in the deeper waters at the mouth of the gully. Fishermen suggested that this production came from a separate, deepwater stock that had not been exploited as much as the Goose Island Gully stock. This opinion was reinforced by the perception that larger than average size fish were landed by the fishery.

Staff of the Fisheries Research Branch suggested that the 'new' fishery was exploiting the same Goose Island Gully stock. Earlier research surveys had consistently found higher catch rates in deeper waters (Table 1), and furthermore, earlier research indicated that Pacific ocean perch move up and down the gully as part of a seasonal migration pattern (Gunderson 1971, Leaman 1985). Biologists suggested that the fishery was simply exploiting the stock on its winter grounds. The average size of the fish appeared larger because 85% of the fish landed in the winter fishery were females, unlike 50% in the summer fishery. Since females are larger than males, catches appeared to be composed of bigger fish. In fact, the size composition of both sexes reflected the summer fishery size composition, only the ratio differed. January to March is when females appear to aggregate prior to parturition, the release of live young. Insemination occurs in the fall months.

## MATERIAL AND METHODS

To further examine the issue, staff from the Rockfish Investigation unit of the Pacific Biological Station participated in two jointly funded commercial trawl trips to the deeper water 'winter' grounds during summer months. It was hypothesized that if there were a distinct resident deepwater stock then it would remain present on these grounds when the other stock moved up the Gully to shallower water in the summer.

In return for payment of fuel costs for the two trips by the Department of Fisheries and Oceans, skippers were asked to explore and fish, where possible, the grounds deeper than 165 fath (300 m) at the mouth of Goose Island Gully.

## RESULTS AND CONCLUSION

Neither cruise found significant quantities of Pacific ocean perch in the deeper waters, at the mouth of Goose Island Gully, and both skippers moved to different grounds in order to finish their trips. The size composition reflected the expected distribution of summer Goose Island Gully catches (Tables 2-5). Table 6 contains incidental observations of the yellowmouth rockfish (S. reedi) and Table 7 and 8 present total catch composition by each vessel.

Results of the two cruises supported the contention that the 'winter' fishery which commenced in 1983 was exploiting the traditional stock on its winter grounds.

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Table 1. Pacific ocean perch mean catch rates, modal sizes, and sex ratio by 20-fath depth interval in Goose Island Gully -- GBR 77-3. (September 1976 and September 1973 values in parentheses.)

| Depth interval (fath) | Year | No. of hauls | Mean catch rate (lb/hr) | Mean catch rate (No./hr) | Mode (cm) | Percent males |
|---|---|---|---|---|---|---|
| 80- 99 | 1977 | 7 | 216 | 201 | 34;18 | 42 |
| | (1976) | (7) | (443) | (358) | (36;18;14) | (51) |
| | (1973) | (7) | (750) | (746) | (22;34;44) | (47) |
| 100-119 | 1977 | 10 | 1777 | 1028 | 38;46;22 | 49 |
| | (1976) | (15) | (2751) | (1730) | (36;30;18) | (52) |
| | (1973) | (11) | (1300) | (729) | (36;44;22) | (41) |
| 120-139 | 1977 | 8 | 1826 | 1029 | 38 | 51 |
| | (1976) | (7) | (2391) | (1253) | (38;30;24) | (47) |
| | (1973) | (7) | (1636) | (807) | (40;36;26) | (46) |
| 140-159 | 1977 | 6 | 2397 | 1258 | 38 | 48 |
| | (1976) | (6) | (3392) | (1896) | (38;30) | (53) |
| | (1973) | (7) | (2670) | (1353) | (36;40;24) | (48) |

Table 2. Size-frequency of S. alutus during summer fishery in the shallower waters of Goose Island Gully, 1982.

| Length (cm) | June 16 | | | June 22 | | | July 2 | | |
|---|---|---|---|---|---|---|---|---|---|
| | M | F | T | M | F | T | M | F | T |
| 25 | 1 | - | 1 | - | - | - | - | - | - |
| 26 | 0 | - | 0 | - | - | - | - | - | - |
| 27 | 0 | - | 0 | - | - | - | - | 1 | 1 |
| 28 | 0 | 1 | 1 | - | 1 | 1 | - | 0 | 0 |
| 29 | 0 | 0 | 0 | - | 0 | 0 | - | 0 | 0 |
| 30 | 0 | 1 | 1 | - | 0 | 0 | - | 0 | 0 |
| 31 | 5 | 2 | 7 | - | 1 | 1 | 1 | 0 | 1 |
| 32 | 1 | 5 | 6 | 1 | 0 | 1 | 3 | 2 | 5 |
| 33 | 4 | 1 | 5 | 0 | 0 | 0 | 1 | 3 | 4 |
| 34 | 3 | 4 | 7 | 0 | 2 | 2 | 1 | 2 | 3 |
| 35 | 6 | 5 | 11 | 10 | 1 | 11 | 8 | 0 | 8 |
| 36 | 23 | 6 | 29 | 24 | 2 | 26 | 21 | 4 | 25 |
| 37 | 34 | 2 | 36 | 28 | 3 | 31 | 24 | 6 | 30 |
| 38 | 42 | 17 | 59 | 39 | 6 | 45 | 34 | 11 | 45 |
| 39 | 50 | 10 | 60 | 36 | 12 | 48 | 48 | 14 | 62 |
| 40 | 15 | 9 | 24 | 32 | 18 | 50 | 35 | 14 | 49 |
| 41 | 9 | 15 | 24 | 15 | 22 | 37 | 12 | 10 | 22 |
| 42 | 2 | 15 | 17 | 9 | 29 | 38 | 1 | 10 | 11 |
| 43 | 3 | 13 | 16 | 0 | 22 | 22 | - | 16 | 16 |
| 44 | 3 | 4 | 7 | 1 | 28 | 29 | - | 11 | 11 |
| 45 | - | 14 | 14 | - | 37 | 37 | - | 2 | 2 |
| 46 | - | 6 | 6 | - | 23 | 23 | - | 9 | 9 |
| 47 | - | - | - | - | 3 | 3 | - | 1 | 1 |
| 48 | - | - | - | - | 2 | 2 | - | - | - |
| 49 | - | - | - | - | 1 | 1 | - | - | - |
| 50 | - | - | - | - | - | - | - | - | - |
| Depth (fath) | | 125-158 | | | 90-115 | | | 106-126 | |
| Total | 201 | 130 | 331 | 195 | 213 | 408 | 189 | 116 | 305 |
| Sex ratio | 61% | 39% | | 48% | 52% | | 62% | 38% | |

Table 3. Size-frequency of S. alutus during winter fishery in the deeper waters at the mouth of Goose Island Gully, 1983.

| Length (cm) | February 21 | | | March 15 | | | March 18 | | |
|---|---|---|---|---|---|---|---|---|---|
| | M | F | T | M | F | T | M | F | T |
| 25 | - | - | - | - | - | - | - | - | - |
| 26 | - | - | - | - | - | - | - | - | - |
| 27 | - | - | - | - | - | - | - | - | - |
| 28 | 1 | - | 1 | - | - | - | - | - | - |
| 29 | 0 | - | 0 | - | - | - | - | - | - |
| 30 | 0 | - | 0 | - | - | - | - | - | - |
| 31 | 0 | - | 0 | - | - | - | - | - | - |
| 32 | 0 | - | 0 | - | - | - | - | - | - |
| 33 | 1 | - | 1 | 1 | | 1 | - | - | - |
| 34 | 1 | - | 1 | 1 | 2 | 3 | 1 | - | 1 |
| 35 | 1 | - | 1 | 5 | 3 | 8 | 0 | - | 0 |
| 36 | 6 | - | 6 | 11 | 4 | 15 | 3 | 1 | 4 |
| 37 | 8 | 2 | 10 | 16 | 4 | 20 | 4 | 4 | 8 |
| 38 | 5 | 14 | 19 | 14 | 20 | 34 | 4 | 6 | 10 |
| 39 | 3 | 26 | 29 | 10 | 28 | 38 | 4 | 16 | 20 |
| 40 | 3 | 44 | 47 | 5 | 44 | 49 | 5 | 41 | 46 |
| 41 | 0 | 51 | 51 | 2 | 45 | 47 | 2 | 33 | 35 |
| 42 | 1 | 50 | 51 | 1 | 33 | 34 | 1 | 61 | 62 |
| 43 | - | 33 | 33 | - | 20 | 20 | 0 | 33 | 33 |
| 44 | - | 22 | 22 | - | 12 | 12 | 1 | 24 | 25 |
| 45 | - | 17 | 17 | - | 13 | 13 | - | 27 | 27 |
| 46 | - | 7 | 7 | - | 7 | 7 | - | 21 | 21 |
| 47 | - | 3 | 3 | - | 2 | 2 | - | 7 | 7 |
| 48 | - | 0 | 0 | - | 1 | 1 | - | 1 | 1 |
| 49 | - | 0 | 0 | - | - | - | - | - | - |
| 50 | - | 0 | 0 | - | - | - | - | - | - |
| 51 | - | 1 | 1 | - | - | - | - | - | - |
| 52 | - | - | - | - | - | - | - | - | - |
| 53 | - | - | - | - | - | - | - | - | - |
| 54 | - | - | - | - | - | - | - | - | - |
| Depth (fath) | | unknown | | | 160-185 | | | 160-190 | |
| Total | 30 | 270 | 300 | 66 | 238 | 304 | 25 | 275 | 300 |
| Sex ratio | 10% | 90% | | 22% | 78% | | 9% | 91% | |

Table 4. Size-frequency of S. alutus*, M/V OCEAN SELECTOR, August 10-22, 1983.

| Date: | August 17 | | | August 17 | | |
|---|---|---|---|---|---|---|
| Haul: | 1 | | | 2 | | |
| Length (cm) | M | F | T | M | F | T |
| 30 | - | - | - | - | - | - |
| 31 | - | 1 | 1 | - | - | - |
| 32 | - | 0 | 0 | - | - | - |
| 33 | - | 0 | 0 | 1 | - | 1 |
| 34 | - | 2 | 2 | 1 | 1 | 2 |
| 35 | 3 | 1 | 4 | 0 | 0 | 0 |
| 36 | 9 | 0 | 9 | 15 | 0 | 15 |
| 37 | 22 | 2 | 24 | 15 | 1 | 16 |
| 38 | 27 | 5 | 32 | 15 | 3 | 18 |
| 39 | 11 | 5 | 16 | 17 | 8 | 25 |
| 40 | 5 | 10 | 15 | 9 | 6 | 15 |
| 41 | 1 | 11 | 12 | 2 | 6 | 8 |
| 42 | - | 12 | 12 | 1 | 9 | 10 |
| 43 | - | 13 | 13 | - | 0 | 0 |
| 44 | - | 11 | 11 | - | 2 | 2 |
| 45 | - | 3 | 3 | - | 1 | 1 |
| 46 | - | 1 | 1 | - | 1 | 1 |
| 47 | - | 1 | 1 | - | - | - |
| 48 | - | - | - | - | - | - |
| 49 | - | - | - | - | - | - |
| 50 | - | - | - | - | - | - |
| Depth (fath) | 148-158 | | | 158-170 | | |
| Total | 78 | 78 | 156 | 76 | 38 | 114 |
| Sex ratio | 50% | 50% | | 68% | 32% | |

*Includes length-sex and length-sex-otolith sample.

Table 5. Size-frequency of S. alutus, M/V FREE ENTERPRISE NO. 1, 1983.

| Date: | August 5 | | | August 6 | | | August 7 | | |
|---|---|---|---|---|---|---|---|---|---|
| Haul: | 7 | | | 12 | | | 14 | | |
| Length (cm) | M | F | T | M | F | T | M | F | T |
| 25 | - | - | - | - | - | - | - | - | - |
| 26 | - | - | - | - | - | - | - | - | - |
| 27 | - | - | - | 1 | 1 | 2 | - | - | - |
| 28 | - | 1 | 1 | 0 | 0 | 0 | - | - | - |
| 29 | 1 | 0 | 1 | 1 | 1 | 2 | - | - | - |
| 30 | 1 | 1 | 2 | 0 | 2 | 2 | - | - | - |
| 31 | 0 | 0 | 0 | 0 | 1 | 1 | - | - | - |
| 32 | 0 | 0 | 0 | 2 | 0 | 2 | 3 | - | 3 |
| 33 | 2 | 1 | 3 | 2 | 4 | 6 | 2 | 1 | 3 |
| 34 | 1 | 1 | 2 | 5 | 2 | 7 | 1 | 2 | 3 |
| 35 | 1 | 0 | 1 | 0 | 3 | 3 | 8 | 6 | 14 |
| 36 | 2 | 0 | 2 | 4 | 4 | 8 | 17 | 8 | 25 |
| 37 | 14 | 2 | 16 | 15 | 3 | 18 | 23 | 17 | 40 |
| 38 | 18 | 3 | 21 | 14 | 6 | 20 | 7 | 19 | 26 |
| 39 | 22 | 8 | 30 | 27 | 4 | 31 | 9 | 32 | 41 |
| 40 | 23 | 9 | 32 | 14 | 8 | 22 | 0 | 21 | 21 |
| 41 | 10 | 25 | 35 | 14 | 6 | 20 | 3 | 9 | 12 |
| 42 | 1 | 13 | 14 | 2 | 12 | 14 | 0 | 6 | 6 |
| 43 | - | 18 | 18 | - | 6 | 6 | 0 | 3 | 3 |
| 44 | - | 8 | 8 | - | 12 | 12 | 1 | 1 | 2 |
| 45 | - | 8 | 8 | - | 3 | 3 | - | 1 | 1 |
| 46 | - | 5 | 5 | - | 3 | 3 | - | - | - |
| 47 | - | 1 | 1 | - | 1 | 1 | - | - | - |
| 48 | - | - | - | - | - | - | - | - | - |
| Depth (fath) | 140-146 | | | 141-142 | | | 182-185 | | |
| Total | 96 | 104 | 200 | 101 | 82 | 183 | 74 | 126 | 200 |
| Sex ratio | 48% | 52% | | 55% | 45% | | 37% | 63% | |
| Maturity[a] summary | 2%-1 | 1%-1 | | 4%-1 | 3%-1 | | 2%-1 | 1%-1 | |
| | 98%-2 | 10%-2 | | 96%-2 | 13%-2 | | 98%-2 | 3%-2 | |
| | | 82%-3 | | | 80%-3 | | | 94%-3 | |
| | | 7%-7 | | | 4%-7 | | | 2%-7 | |

[a]See Table 9.

Table 6. Size frequency of S. reedi, M/V FREE ENTERPRISE NO. 1, 1983.

| Date: | August 3 | | | August 4 | | |
|---|---|---|---|---|---|---|
| Haul: | 4 | | | 5 | | |
| Length (cm) | M | F | T | M | F | T |
| 35 | - | - | - | - | - | - |
| 36 | - | - | - | - | - | - |
| 37 | - | - | - | - | - | - |
| 38 | - | - | - | - | 1 | 1 |
| 39 | - | - | - | - | 0 | 0 |
| 40 | - | - | - | - | 0 | 0 |
| 41 | 2 | 1 | 3 | 4 | 2 | 6 |
| 42 | 4 | 5 | 9 | 6 | 3 | 9 |
| 43 | 14 | 11 | 25 | 6 | 10 | 16 |
| 44 | 20 | 19 | 39 | 15 | 11 | 26 |
| 45 | 17 | 34 | 51 | 14 | 25 | 39 |
| 46 | 13 | 21 | 34 | 15 | 26 | 41 |
| 47 | 3 | 9 | 12 | 7 | 14 | 21 |
| 48 | 4 | 10 | 14 | - | 13 | 13 |
| 49 | - | 4 | 4 | - | 10 | 10 |
| 50 | - | - | - | - | 4 | 4 |
| Depth (fath) | | 124-131 | | | 125-126 | |
| Total | 77 | 114 | 191 | 67 | 119 | 186 |
| Sex ratio | 40% | 60% | | 36% | 64% | |
| Maturity[a] summary | 18%-6<br>82%-2 | 100%-7 | | 7%-6<br>93%-2 | 100%-7 | |

[a]See Table 9.

Table 7. Summary of catch (t) by species, M/V OCEAN SELECTOR, August 10-22, 1983.

| Species | Catch | Percent |
|---|---|---|
| *Sebastes alutus* | 11.8 | 49.8 |
| *S. diploproa* | 2.4 | 10.2 |
| *S. reedi* | 8.9 | 37.7 |
| others* | .6 | 2.3 |
| Total | 23.7 | 100.0 |

*Includes all species that amounted to <1% of the total catch.

Table 8. Summary of catch (t) by species, M/V FREE ENTERPRISE NO. 1, July 31-August 9, 1983.

| Species | Catch | Percent |
|---|---|---|
| *Atheresthes stomias* | 2.6 | 4.1 |
| *Sebastes alutus* | 35.1 | 54.5 |
| *S. diploproa* | 4.3 | 6.6 |
| *S. reedi* | 18.9 | 29.3 |
| *Anoplopoma fimbria* | 1.8 | 2.8 |
| other* | 1.7 | 2.7 |
| Total | 64.4 | 100.0 |

*Includes all species that amounted to <1% of the total catch.

Table 9. Description of rockfish maturity stages.

| Maturity code | | Gonad condition |
|---|---|---|
| Females: | 1 | Immature (translucent, small) |
| | 2 | Maturing (small, yellow eggs; translucent or opaque) |
| | 3 | Mature (large, yellow eggs; opaque) |
| | 4 | Fertilized (large, orange-yellow eggs; translucent) |
| | 5 | Embryos or Larvae (includes eyed eggs) |
| | 6 | Spent (large, flaccid, red ovaries. A few larvae may be present) |
| | 7 | Resting (moderate size, form, red-grey ovaries) |
| Males: | 1 | Immature (translucent, stringlike) |
| | 2 | Maturing (swelling, brown-white) |
| | 4 | Mature (large, white; easily broken) |
| | 5 | Ripe (running sperm) |
| | 6 | Spent (flaccid, red) |
| | 7 | Resting (ribbon-like; small, brown) |